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**Rolling contact device**

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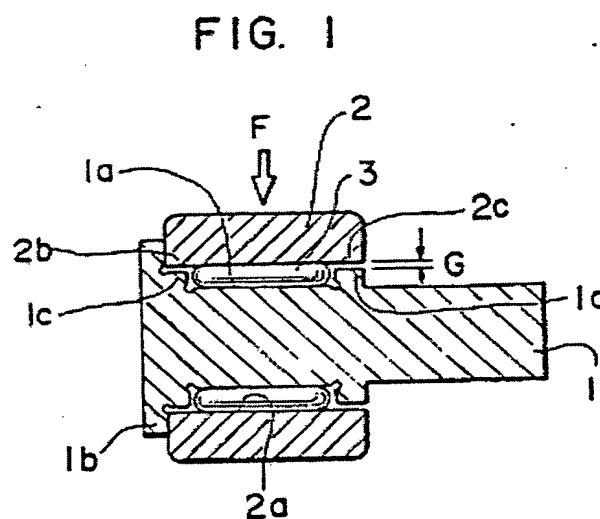
Cited documents:

US2352911  
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**Abstract of EP0335391**

A rolling contact device having a shaft (1) adapted to be secured to an element of an apparatus, an outer ring (2) adapted to be in rolling contact with another element of the apparatus, and rolling elements (3) disposed between the shaft (1) and the outer ring (2). An abutting portion (1c)(1d)(2b)(2c) is provided on each of the shaft (1) and the outer ring (2), the abutting portions on the shaft and the outer ring being opposed to each other with a small gap (G) defined therebetween. These abutting portions are arranged such that, when an excessive radial load is applied to the outer ring, the abutting portions are brought into contact with each other to prevent permanent deformation of rolling contact portions of the device.



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# EUROPEAN PATENT APPLICATION

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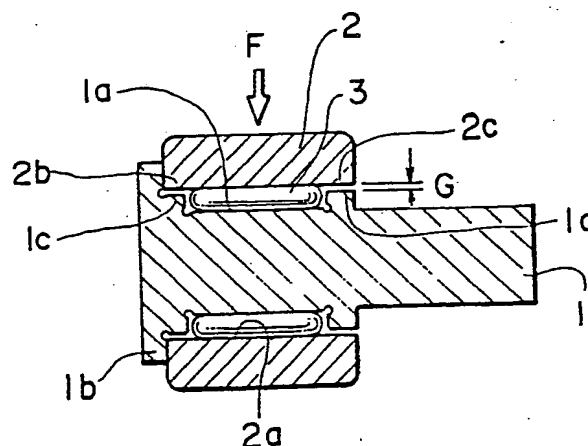
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(54) Rolling contact device.

(57) A rolling contact device having a shaft (1) adapted to be secured to an element of an apparatus, an outer ring (2) adapted to be in rolling contact with another element of the apparatus, and rolling elements (3) disposed between the shaft (1) and the outer ring (2). An abutting portion (1c)(1d)(2b)(2c) is provided on each of the shaft (1) and the outer ring (2), the abutting portions on the shaft and the outer ring being opposed to each other with a small gap (G) defined therebetween. These abutting portions are arranged such that, when an excessive radial load is applied to the outer ring, the abutting portions are brought into contact with each other to prevent permanent deformation of rolling contact portions of the device.

## FIG. 1



EP 0 335 391 A1

## ROLLING CONTACT DEVICE

## BACKGROUND OF THE INVENTION

## FIELD OF THE INVENTION

5 The present invention relates to a rolling contact device such as a cam follower used in the technical field of machine tool or the like, and more particularly to a rolling contact device which comprises a shaft having an outer track surface, an outer ring surrounding the shaft and having an inner track surfaces, and rolling elements disposed between the shaft and the outer ring in a relationship spaced apart from each other circumferentially of the shaft.

## DESCRIPTION OF THE PRIOR ARTS

15 Heretofore, there is known a rolling contact device of the above mentioned type, in which one end of the shaft is adapted to be secured to an element of a machine and the peripheral surface of the outer ring is made in rolling contact with a cam surface of a cam for serving as a cam follower. Such a cam follower is disclosed, for example, in Japanese Patent Publication No. 54-20534. The rolling contact device of this type is also used for moving a machine element together with the rolling contact device along a guiding rail with one end of the shaft secured to the machine element and with the peripheral surface of the outer ring in rolling contact with the rail.

20 The above-mentioned rolling contact device of prior art suffers from a problem that when a radial load greater than a certain value, such as an impact load, is applied to the outer ring, permanent deformations or press traces occur on the contact portions among the track surface of the shaft, the rolling elements and the track surface of the outer ring, thereby deteriorating the precision of the device.

## SUMMARY OF THE INVENTION

30 It is an object of the invention to provide a rolling contact device which may solve the above-described problem of the prior art.

According to the invention, there is provided a rolling contact device comprising: a shaft having an outer track surface; an outer ring surrounding the shaft and having an inner track surface; rolling elements disposed between the shaft and the outer ring in a relationship spaced apart from each other circumferentially of the shaft, the outer peripheral surface of the outer ring being adapted to be in rolling contact with a track surface of an element of an apparatus; and an at least one abutting portion provided on each of the shaft and the outer ring; the abutting portions on the shaft and the outer ring being radially opposed to each other with a small gap defined therebetween, and being arranged such that, when a radial load greater than a predetermined value acts on the outer ring, the abutting portions may abut against each other, thereby reducing radial load acting on contact portions among the track surface of the outer ring, the rolling elements and the track surface of the shaft.

40 The above and other objects, features and advantages of the invention will become more apparent from the following description with reference to the accompanying drawings.

## BRIEF DESCRIPTION OF THE DRAWINGS

45 Fig. 1 is a cross-sectional view of a rolling contact device according to a first embodiment of the present invention.

50 Fig. 2 shows the function and the advantage of a rolling contact device of the present invention.

Figs. 3, 4, 5, 6 and 7 show second, third, fourth, fifth and sixth embodiments of the present invention, respectively.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

FIG. 1

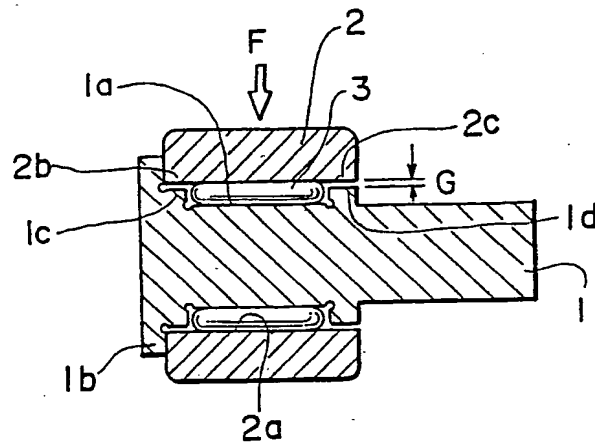


FIG. 2

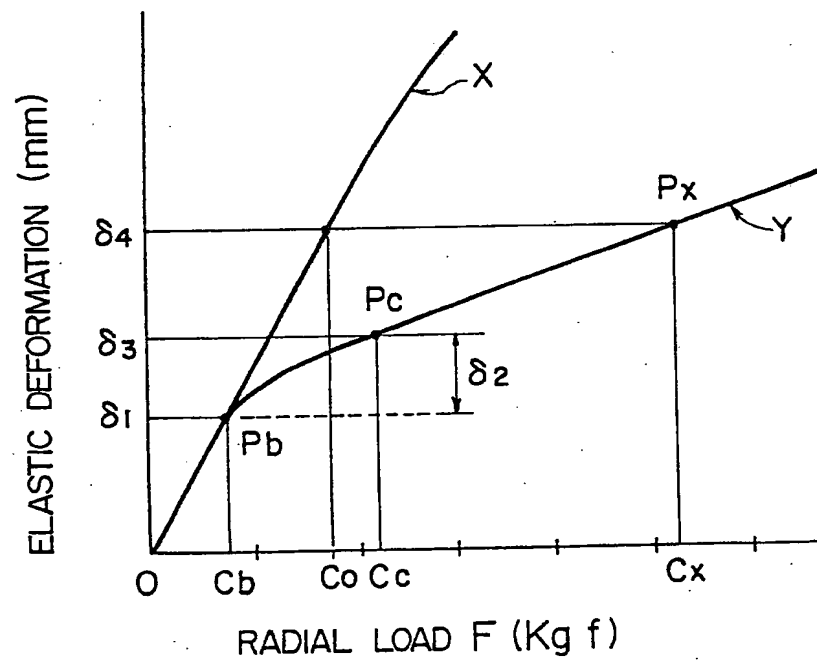


FIG. 3

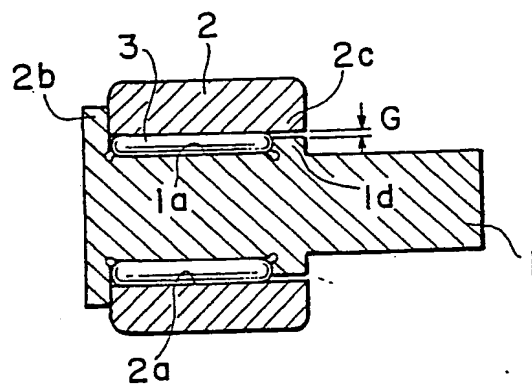


FIG. 4

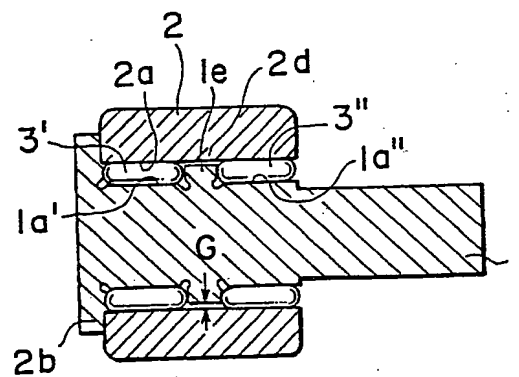


FIG. 5

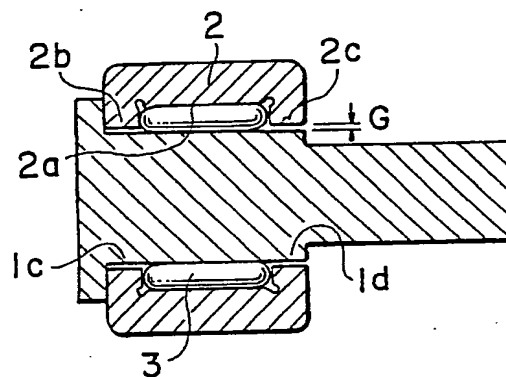


FIG. 6

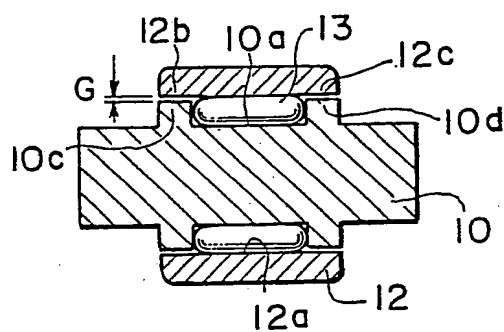


FIG. 7

